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## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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## Sheet

1

of

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Application Number

09/274.430

Filing Date

March 22, 1999

**First Named Inventor**

**Michael Barrow**

### Group Art Unit

2814

**Examiner Name**

Attorney Docket Number

042390.P3495C2

## U.S. PATENT DOCUMENTS

[illegible]

## FOREIGN PATENT DOCUMENTS

[illegible]

**Examiner  
Signature**

Date:

**Considered**

12/7/2002

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→ John B. Vazirani

11/08/04

Paper No. 0804



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Substitute for form 1449A/PTO

## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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**OTHER ART (Including Title, Author, Date, Pertinent Pages, etc.)**

[illegible]

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Signature**

Date \_\_\_\_\_

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Page No. 0804

Substitute for Form 1449/PTO

INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT  
(use as many sheets as necessary)

Complete if Known

Application Number	09/925,835
Filing Date	August 7, 2001
First Named Inventor:	Michael Barrow
Art Unit	2841
Examiner Name	Not Yet Assigned
Attorney Docket Number	42.P3495C3

Sheet 1 of 2

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)				
OIPB AUG 17 2004 U.S. PATENT & TRADEMARK OFFICE		US-				
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FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document			Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)				

Examiner Signature	John B. Vignati	Date Considered	11/08/04
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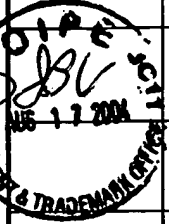
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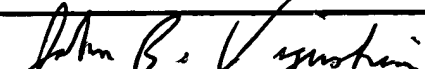
This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SENT FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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Page No. 0804

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<b>Substitute for Form 1449/PTO</b>  <b>INFORMATION DISCLOSURE</b> <b>STATEMENT BY APPLICANT</b> <i>(use as many sheets as necessary)</i>				<b>Complete if Known</b>	
				Application Number	09/925,835
				Filing Date	August 7, 2001
				First Named Inventor:	Michael Barrow
				Art Unit	2841
				Examiner Name	Not Yet Assigned
Sheet	2	of	2	Attorney Docket Number	42.P3495C3
<b>NON PATENT LITERATURE DOCUMENTS</b>					
Examiner Initials*	Cite No <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published			T <sup>2</sup>
		Nikkei Microdevices. "Retention tape becomes BGA with holes." 1995, page 17.			

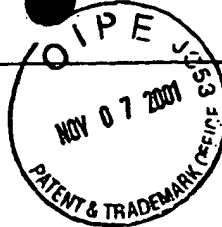
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Paper No. 0804

Substitute for Form 1449A/PTO (Mo (use as many sheets as necessary))	Attorney Docket No.: 042390P3495C2	Application Number: 09/274,430
Page 1 of 11	First Named Inventor: Michael Barrow	
	Filing Date: March 22, 1999	



### U.S. PATENT DOCUMENTS

Exam. Initial*	Cite No.¹	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number	Kind Code² (If known)			
		4,887,148		Mu	12/12/1989	
		5,216,278		Lin et al.	6/1/1993	
		5,285,352		Pastore et al.	2/8/1994	
		5,355,283		Marrs et al.	10/11/1994	
		5,367,435		Andros et al.	11/22/1994	
		5,450,283		Lin et al.	9/12/1995	
		5,490,324		Newman	2/13/1996	
		5,506,756		Haley	4/9/1996	
		5,650,660		Barrow	7/22/1997	
		5,686,699		Chu et al.	11/11/1997	
		4,688,170		Waite et al.	8/18/1987	
		5,367,435		Andros et al.	11/22/1994	

### FOREIGN PATENT DOCUMENTS

Exam. Initial*	Cite No.¹	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T⁶
		Office³	Number⁴	Kind Code⁵ (If known)				

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*Paper No. 17*  
*⇒ Paper No. 0804*

Substitute for Form 1449A/PTO (Modifications) (use as many sheets as necessary)		Attorney Docket No. 042390P3495C2	Application Number: 09/274,430
Page 2 of 11		First Named Inventor: Michael Barrow	Filing Date: March 22, 1999
<b>OTHER ART - NO PATENT LITERATURE DOCUMENTS</b>			
Examiner Initials*	Cite No <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume, issue number(s), publisher, city and/or country where published	Translation <sup>2</sup>
JBL		1991 Proceedings, 41 <sup>st</sup> Electronic Components & Technology Conference, May 11-16, 1991, Atlanta, Georgia	
		Bruce Freyman et al., "Surface Mount Process Technology for Ball Grid Array Packaging, Amkor Electronics Inc., Tempe, Arizona, pgs. 81-85	
		Bruce Freyman et al., "Surface Mount Process Technology for Ball Grid Array Packaging"; JUNICHO SHIMIZU, "Plastic Ball Grid Array Coplanarity" Citizens Watch Co, Tokyo Japan, Surface Mount International Conference & Exposition, San Jose, California, Aug 29-Sept 2, 1993, pgs. 81-91	
		Dave Hattas, "BGAs Face Production Testing", Advanced Packaging, Summer 1993, pgs. 44-46	
		Electronic Packaging & Production: Concurrent Engineering for Packaging, Fabrication & Assembly, Articles, March 1993, Vol. 3, No. 33	
		Julie Houghten, "Takes on QFPs" Advanced Packaging, Winter 1993, pgs 38-39	
		Randy Johnson et al., "Ball Grid Array Technology: A Feasibility Study of Ball Grid Array Packaging", Nepron Conference, Proceeding of the Technical Program, June 14-17, 1993 Boston Massachusetts, pgs 411-430	
		Electronic Packaging & Production: Concurrent Engineering for Packaging, Fabrication & Assembly, Articles, May 1992	
		Andrew Mawer et al., "Calculation of Thermal Cycling and Applications Fatigue Life of the Plastic Ball Grid Array (BGA) Package", Proceeding of the 1993 International Electronics Packaging Conference, September 12-15, 1993 San Diego, California, vol. 2, pgs. 718-730	
		Amkor BGA Packaging, "Taking the World by Storm", Amkor Electronics, Chandler, AZ	
		Leo Anderson et al., "Solder Attachment Analysis of Plastic BGA Modules", Surface Mount International, San Jose, CA, August 1994, pgs. 189-194	
	✓		Dr. Abbas I. Attarwala et al., "Failure Mode Analysis of a 540 Pin Plastic Ball Grid Array", Surface Mount International, San Jose, CA, August 1994, pgs. 252-257

Examiner Signature	<i>John B. Vigoda</i>	Date Considered	09/09/02
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Paper No. ~~0804~~ 0804

Substitute for Form 1449A/PTO (Mod.) (use as many sheets as necessary)	Attorney Docket No. 042390P3495C2	Application Number: 09/274,430
Page 3 of 11	First Named Inventor: Michael Barrow	Filing Date: March 22, 1999

**OTHER ART - NO PATENT LITERATURE DOCUMENTS**

Examiner Initials*	Cite No <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	Translation <sup>2</sup>
JW		Surface Mount International Conference & Exposition: Proceedings of The Technical Program, San Jose, CA, Aug 28-Sept 1, 1994	
		C.E. Bauer, "Partitioning and Die Selection Strategies for Cost Effective MCM Designs"; W.E. BERNIER et al., "BGA vs QFP: A Summary of Tradeoffs for Selection of High I/O Components"; A.J. MAWER et al., "Plastic Ball Grid Array Solder Joint Reliability Considerations"; Dr. W.C. Mak et al., "Increased SOIC Power Distribution Capability Through Board Design and Finite Element Modeling", Journal of Surface Mount Technology, October 1994	
		W.E. Bernier et al., "BGA vs QFP: A Summary of Tradeoffs for Selection of High I/O Components", Surface Mount International Conference & Exposition, Proceedings of The Technical Program, San Jose, CA, Aug 30-Sept 1, 1994 pgs. 181-185	
		Marie Cole et al., "Ball Grid Array Packaging", Surface Mount International Conference & Exposition, Proceedings of The Technical Program, San Jose, CA, Aug 30-Sept 1, 1994 pgs. 147-153	
		Electronic Packaging & Production, Articles, vol. 34, No. 12, December 1994	
		Advanced Packaging, "BGAs for MCMs: An Enabling Technology Emerges", Articles, September/October 1994	
		Suzanne Fauser et al., "High Pin Count PBGA Assembly: Solder Defect Failure Modes and Root Cause Analysis", pgs. 169-174	
		InterConnection Technology Articles, September 1993	
		Curtis Hart, "Vias in Pads for Coarse and Fine Pitch Ball Grid Arrays", Surface Mount International Conference & Exposition, Proceedings of The Technical Program, San Jose, CA, Aug 30-Sept 1, 1994	
		L.C. Matthew et al. "Reliability- Area Array Packaging"; Roland Heitmann, "Assembly-A Direct Attach Evolution", Advanced Packing, Microwave RF Packaging, Articles, July/August 1994,	
		Charles L.Hutchins "Understanding Grid Array Packages", Surface Mount Technology Magazine, November 1994, pgs 12-13	
	↓		Jennie S. Hwang, "Reliability of BGA Solder Interconnections" Surface Mount Technology Magazine, September 1994, pgs 14-15

Examiner Signature <i>J.W. Vignath</i>	Date Considered 09/09/02
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*Page No 170804*

Substitute for Form 1449A/PTO (Modifying) (use as many sheets as necessary)		Attorney Docket No. 042390P3495C2	Application Number: 09/274,430
Page 4 of 11		First Named Inventor: Michael Barrow	Filing Date: March 22, 1999
<b>OTHER ART - NO PATENT LITERATURE DOCUMENTS</b>			
Examiner Initials*	Cite No <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume, issue number(s), publisher, city and/or country where published	Translation <sup>2</sup>
JAV		J. Lau et al., "No Clean Mass Reflow of Large Plastic Ball Grid Array Packages" Printed Circuit Interconnection Federation, Circuit World, Vol. 20, No. 3, March 1994, pgs 15-22	
		John H. Lau et al. "No Clean Mass Reflow of Large Plastic Ball Grid Array Packages", Journal of Surface Mount Technology, pgs 3-14, July 1994	
		Charles E. Bauer, Ph.D. et al., "Partitioning and Die Selection for Cost Effective MCM Designs", pgs 4-9; W.E. Bernier et al., "BGA vs QFP: A Summary of Tradeoffs for Selection of High I/O Components", pgs 10-15; Andrew J. Mawer et al. "Plastic Ball Grid Array Solder Joint Reliability Considerations", pgs 16-32; Dr. W.C. Mak et al. "Increased SOIC Power Dissipation Capability Through Board Design and Finite Element Modeling", pgs 33-42, Journal of Surface Mount Technology, October 1994	
		Michael Dobers et al., "Design-Low Cost MCMs", pgs 28-32; "Ken Gilleo, "Materials-Electronic Polymers, pgs 37-42"; Robert C. Marrs et al, "Market Trends-BGAs for MCMs, pgs 48-52, Advanced Packaging Magazine, BGAs for MCMs, September/October 1994	
		L. C. Mathew et al. "Reliability-Area Array PackingZ", pgs 91-94; "Assembly-A Direct Attach Evolution", pgs 95-99, Advanced Packing Magazine, Microwave RF Packaging, July/August 1994	
		Andrew J. Mawer et al, "Plastic Ball Grip Array Solder Joint Reliability Considerations", pgs 16-32, Journal of Surface Mount Technology, October 1994	
		Tony Mazzullo, "How IC Packages Affect PCB Design", Surface Mount Technology Magazine, Nepcon West '95, February 1995, pgs 114-116	
		Joel Mearig, "An Overview of Manufacturing BGA Technology", Proceeding of the Technical Program, Nepcon West '95 Conference, Feburary/March 1995, Anaheim, CA, pgs 295-299	
		Atila Mertol, "Application of the Taguchi Method on the Robust Design of Molded 225 Plastic Ball Grid Array Packages", IEEE Transactions on Components, Packaging, and Manufacturing Technology, Part B: Vol. 18, No. 4, November 1995, pgs 734-743	
		Shailesh Mulgaonker et al., "An Assessment of the Thermal Performance of the PBGA Family", IEEE Transactions on Components, Packaging, and Manufacturing Technology, Part A. Vol. 18. No 4., December 1995, pgs 739-748	
	Electronic Design Magazine, April 17, 1995, Various Articles.		
		Reader Service: Hewlett Packard, Actel, Mini-Circuits; Electronic Design, April 1995, Vol. 43, No. 8; Nikkei Microdevices Magazine, Various Articles	

Examiner Signature	<i>John B. Vignati</i>	Date Considered	09/09/02
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*Page No. 180804*





First Named Inventor:

Michael Barrow

Filing Date:

March 22, 1999

OTHER ART - NO PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	Translation
PBV		Nikkei Microdevices, March 1995, Various Articles	
		John H. Lau, "Ball Grid Array Technology" Publication, pgs 1-636	
		Electronic Packaging & Production Literature Review, February 1995	
		LSI Logic Package Selector Guide, 1994-1995	
		Robert Marrs et al., "Recent Technology Breakthroughs Achieved with the New Super BGA Package", Proceeding of the Technical Conference, 1995 International Electronics Packaging Conference, San Diego, CA September 1995, pgs 565-576	
		Jonathan L. Houghten, "Plastic Ball-Grid Arrays Continue to Evolve", Electronic Design Magazine, February 1995, 141-146	
		Wayne Huang et al. "Electrical Characterization of PBGA for Communication Applications by Simulation and Measurement" Proceeding of the Technical Program, Nepcon West '95, Conference February/March 1995, Anaheim, CA, pgs 307	
		Greg Reed, "NEPCON Highlights Thriving Industry"; Jenny S. Hwang, "A Hybrid of QFP and BGA Architectures", Surface Mount Technology Magazine, February 1995	
		Microprocessor Report, November 1995, Vol. 9, No. 15, Michael Slater "Intel Boosts Pentium Pro to 200 MHz", "AMD Buys NexGen to Boost x86 Position"; Linly Gwennap "Integrated PA-7300LC Powers HP Midrange", "UltraSparc to Pick Up Speed in 1996"; Jim Turley "StrongArm Punches Up ARM Performance"; Brian Case "First Trimedia Chip Boards PCI Bus"; and Mike Johnson "RISC-like Design Fares Well for x86 CPUs	
		Linly Gwennap "Intel's P6 Bus Designed for Multiprocessing" Microprocessor Report, Vol. 9, No. 7, May 1995, pgs 2-6	
		IPC National Ball Grid Array Symposium, Supplement to the Proceedings, March 1995, Dallas TX	
		T. Kawahara et al. "Ball Grid Array Type Package by Using of New Encapsulation Method", Proceedings of the 1995 International Electronics Packaging Conference, San Diego, CA, September 1995	

Examiner Signature	<i>John B. [Signature]</i>	Date Considered	09/09/02
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*11/08/04*  
*Paper No. 120804*

Substitute for Form 1449A/PTO (Modi. (use as many sheets as necessary))		Attorney Docket No. 042390P3495C2	Application Number: 09/274,430
Page 6 of 1		First Named Inventor: Michael Barrow	
		Filing Date: March 22, 1999	
<b>OTHER ART—NO PATENT LITERATURE DOCUMENTS</b>			
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JRV		John U. Knickerbocker et al., "Materials: Ceramic BGA" Advanced Packaging Magazine, January/February 1995, pgs 20-25	
		Gary Kromann et al., "A Hi-Density C4/CBGA Interconnect Technology for a CMOS Microprocessor", Proceeding of the Technical Program, Nepcon West '95 Conference, February/March 1995, Anaheim, CA, pgs 1523-1529	
		Balwant S. Lall et al., "Methodology for Thermal Evaluation of Multichip Modules" IEEE Transactions on Components, Packaging, and Manufacturing Technology Part A, December 1995, Vol. 18, No. 4, pgs 758-764	
		Steve Rooks, "X-Ray Inspection of Flip Chip Attach Using Digital Tomosynthesis" Surface Mount International Conference & Exposition, Proceedings of the Technical Program, San Jose, CA, August/September 1994, pgs 195-202	
		Paul Mescher et al., "A Practical Comparison of Surface Mount Assembly for Ball Grid Array Components" Surface Mount International, Proceedings of the Technical Program, San Jose, CA, August/September 1994, pgs 164-168	
		Gil Olachea, "Managing Heat: A Focus On Power IC Packaging" Electronic Packaging & Production, November 1994, pgs 26-28	
		C. Ramirez et al., "Fatigue Life Comparison of the Perimeter and Full Plastic Ball Grid Array, pgs 258-266	
		Steve Rooks, "X-Ray Inspection of Flip Chip Attach Using Digital Tomosynthesis" Surface Mount International Conference & Exposition, Proceedings of the Technical Program, San Jose, CA, August/September 1994, pgs 195-202	
		Richard E. Sigliano, "Market Trends: Using BGA Packages", Advanced Packaging, March/April 1994, pgs 36-40	
		David B. Walshak, Jr., "Thermal Modeling of a Multichip BGA Package" Proceedings of the Technical Program, Nepcon West Conference, February/March 1994, Anaheim CA, pgs 1266-1276	
	David Walshak et al., "BGA Technology: Current and Future Direction for Plastic, Ceramic and Tape BGA's, MCC, Austin TX, pp 157-163		
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Examiner Signature	<i>John B. Vignath</i>	Date Considered	09/09/02
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*Paper No. 0804*

Substitute for Form 1449A/PTO (Modin. (use as many sheets as necessary))		Attorney Docket No. 042390P3495C2	Application Number: 09/274,430
Page 7 of 11		First Named Inventor: Michael Barrow	Filing Date: March 22, 1999
OTHER ART AND PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	Translation <sup>2</sup>
		Michael A. Zimerman "High Performance BGA Molded Packages for MCM Application" Surface Mount International Conference & Exposition, Proceedings of the Technical Program, San Jose, CA, August 1994, pp 175-180	
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JW		Bruce Freyman et al., "The Move to Perimeter Plastic BGA's" Surface Mount International, Proceedings of the Technical Program, San Jose, CA, August 1995 pp. 373-382.	
		Bruce M. Guenin et al., "Analysis of a Thermally Enhanced Ball Grid Array Package", IEEE Transactions on Components, Packaging, and Manufacturing Technology-Part A, Vol. 18, No. 4, December 1995, pp 749-757	
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JBL		Ed Zamborsky, "BGAs in the Assembly Process", Circuits Assembly, Vol. 6, No. 2, February 1995, pp 60-64	
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		"Pad Array Improves Density" Electronic Packaging & Production, June 1993	
		Suzanne Fauser et al., "High Pin-Count PBGA Assembly", Circuits Assembly, February 1995	

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<i>AB</i>		Michael Barrow, "Perimeter Matrix Ball Grid Array Circuit Package with a Populated Center", International Search Report, PCT/US97/03511, March 1996	
		LSI Logic Corporation, Package Selector Guide, 1991-1995	
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		Andrew Mawer et al., "Calculation of Thermal Cycling and Application Fatigue Life of the Plastic Ball Grid Array (BGA) Package", Proceedings of the 1993 International Electronics Packaging Conference, Vol. 2, San Diego, Ca, September 1993	
		Charles E. Bauer, "Partitioning and Die Selection Strategies for Cost Effective MCM Designs" Surface Mount Technology Association, Journal of Surface Mount Technology, October 1994, pp 4-9	
		Andrew J. Mawer et al., "Plastic Ball Grid Array Solder Joint Reliability Considerations", Surface Mount Technology Association, Journal of Surface Mount Technology, October 1994, pp 16-32	
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[Signature]		Philip E. Rogren, "MCM-L Built on Ball Grid Array Formats", Surface Mount International, Proceedings of the Technical Program, San Jose, Ca, August/September 1994	
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		Andrew Mawerand et al., "Reliable BGAs Take on Extra Routes" Electronic Engineering Times 98, Interconnects & Packaging, Issue 816, September 194	
		Johnathan L. Houghten, "Plastic Ball-Grid Arrays Continue to Evolve", February 6, 1995 issue of Electronic Design, Vol. 43, No. 3, pgs 5, 7, 141-146, Penton Publishing Inc., Cleveland, OH	
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2

Application Number

09/274,430

Filing Date

**March 22, 1999**

**First Named Inventor:**

## Michel Barrow

### Group Art Unit

2841

Examiner Name \_\_\_\_\_

~~David A. Foster~~

Attorney Docket Number

042390P3495C2

## U.S. PATENT DOCUMENTS

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Application Number	09/274,430
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First Named Inventor:	Michael Barrow
Group Art Unit	2841
Examiner Name	David A. Foster <i>John Vignata</i>
Attorney Docket Number	042390P3495C2

Sheet 1

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<i>JBV</i>		Bruce Freyman et al. "Surface Mount Process Technology for Ball Grid Array Packaging", Surface Mount International, August 29-September 2, 1993, Amkor Electronics Inc., San Jose, California, pgs 81-85	
<i>JBV</i>		Johnathan L. Houghten "Plastic Ball-Grid Arrays Continue to Evolve", Electronic Design Magazine, February 6, 1995, pgs 141-146, Vol. 43, No. 3, Penton Publishing	
<i>JBV</i>		LSI Logic Corporation, Package Selector Guide 1994-1995, Second Edition, Milpitas, California	
<i>JBV</i>		LSI Logic Corporation, Package Selector Guide 1994-1995 Errata	
<i>JBV</i>		Semiconductor Group Package Outlines Reference Guide, Texas Instruments Incorporated, Plastic Ball Grid Array Drawings, 1995	

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